Remarks

Claims 1-42 are pending in the application. Claims 1, 22, 35 and 39 have been amended herein. Favorable reconsideration of the application, as amended, is respectfully requested.

I. REJECTION OF CLAIM 1 UNDER 35 USC §102

Claims 1, 6, 11, 20 and 35-36 stand rejected under 35 USC 102(b) as being anticipated by *Papadimitriou et al.* (Epipolar Line Estimation and Rectification for Stereo Image Pairs, IEEE, 1996, hereinafter *Papadimitriou*). Claims 1, 14, 22-24, 33-34 and 39-40 stand rejected under 35 USC 102(b) as being anticipated by *Courtney et al.* (A Hardware Architecture for Image Rectification and Ground Plane Obstacle Detection, IEEE, 1992, hereinafter *Courtney*). Withdrawal of the rejection is respectfully requested for at least the following reasons.

Independent claims 1 and 35 have been amended to more clearly recite the claimed invention and now recite a method and system for rectifying a stereoscopic image that includes first and second images captured using a respective one of first and second image capture devices, wherein first and second rectification transformations are determined for rectifying a respective one of the first and second images so as to reduce vertical disparity, characterized in that *statistical probability analysis* of the parameters of the stereoscopic image capture device are used in the determination of the first and/or second rectification transformations.

A. Papadmitriou

In rejecting original claims 1 and 35, the Examiner broadly defined the term "statistics" to be a collection of quantitative data. Further, the Examiner indicated that the coefficients {ai, i=0...,5} used in equations 5 and 6 of *Papadimitriou,* which represent camera parameters that are functions of the focal lengths, the coordinate image centers and the pan angles, read on the broad term "statistics" or quantitative data. Applicants do not agree with the Examiner's interpretation of the coefficients being "quantitative data". Nevertheless, claims 1 and 35 have been amended to recite that *statistical probability analysis* of the parameters of the stereoscopic image capture device are used in the determination of the first and/or second rectification transformations. The coefficients of *Papadimitriou* are not equivalent to statistical probability analysis, nor have they been shown to be obtained using statistical probability analysis. *Papadimitriou* has not been shown to teach or suggest using *statistical probability*

analysis of the parameters of the stereoscopic image capture device are used in the determination of the first and/or second rectification transformations, as recited in claims 1 and 35.

Accordingly, withdrawal of the rejection of claims 1 and 35 with respect to *Papadimitriou* is respectfully requested.

Claims 6, 11, 20 and 36 directly or indirectly depend from claim 1 or claim 35 and, therefore can be distinguished from *Papadimitriou* for at least the same reasons.

Accordingly, withdrawal of the rejection of claims 6, 11, 20 and 36 with respect to *Papadimitriou* is respectfully requested.

B. Courtney

1. Claims 1 and 14

The Examiner contends that the calibration parameters of *Courtney* relating to aspect ratios, focal lengths, etc., are "quantitative data" and therefore read on the term "statistics". Again, Applicants do not agree that calibration parameters are quantitative data. Nevertheless, claims 1 and 35 have been amended to recite that *statistical probability analysis* of the parameters of the stereoscopic image capture device are used in the determination of the first and/or second rectification transformations. The calibration parameters of Courtney are not equivalent to statistical probability analysis, nor have they been shown to be obtained using statistical probability analysis. *Courtney* has not been shown to teach or suggest using *statistical probability analysis* of the parameters of the stereoscopic image capture device are used in the determination of the first and/or second rectification transformations, as recited in claim 1.

Accordingly, withdrawal of the rejection of claim 1 with respect to Courtney is respectfully requested.

Claim 14 depends from claim 1 and, therefore can be distinguished from *Courtney* for at least the same reasons.

Accordingly, withdrawal of the rejection of claim 14 with respect to Courtney is respectfully requested.

2. Claims 22-24, 33-34 and 39-40

Independent claims 22 and 39 have been amended and now recite the aspect wherein the first and second rectification transformations are determined so that the first and second rectification transformations correspond to a virtual alignment to a parallel camera setup, wherein determining the first and second rectification transformation includes calculating a shear component such that a final matrix is a combination of a rotation and a translation and at least one internal camera parameter.

As disclosed in the specification, the choice of the horizontal shear and scaling components of the transformations is constrained to ensure that the resultant pair of rectifying transformations corresponds to a virtual alignment to a parallel camera set-up. To ensure this the shear component is calculated from an equation formulated such that the final matrix is a combination of a rotation and a translation and the internal camera parameters. The rotation and translation ensure that the solution corresponds to a virtual alignment to a parallel camera set-up, in contrast to prior art methods. (Page 38, first paragraph of the specification).

Courtney discloses a rectification transform that is expressed as a 3x3 homogeneous coordinate transform. Courtney, however, has not been found to disclose determining the first and second rectification transformation by calculating a shear component such that a final matrix is a combination of a rotation and a translation and at least one internal camera parameter. Therefore, Courtney does not anticipate amended claims 22 and 39.

Accordingly, withdrawal of the rejection of claims 22 and 39 is respectfully requested.

Claims 23-24, 33-34 and 40 directly or indirectly depend from claim 22 or claim 39 and, therefore can be distinguished from *Courtney* for at least the same reasons.

Accordingly, withdrawal of the rejection of claims 23-24, 33-34 and 40 is respectfully requested.

II. REJECTION OF CLAIM 1 UNDER 35 USC §103

A. Claims 2, 7-10, 15-17, 19, 21 and 37-38

Claim 2 stands rejected under 35 USC 103(a) as being unpatentable over *Papadimitriou* in view of U.S. Patent No. 6,608,923 to *Zhang*. Claims 7-10 and 37-38 stand rejected as being unpatentable over *Papadimitriou*. Claim 21 stands rejected as being unpatentable over *Papadimitriou* in view of Applicant's admitted prior art. Claims 15-17, and 19 stand rejected as being unpatentable over *Courtney* in view of U.S. Patent No. 5,142,357 to *Lipton* in further view of Applicant's admitted prior art. Withdrawal of the rejection is requested for at least the following reasons.

As was discussed above, the Examiner contends that the coefficients {ai, i=0...,5} used in equations 5 and 6 of *Papadimitriou*, which represent camera parameters that are functions of the focal lengths, the coordinate image centers and the pan angles, read on the broad term "statistics" or quantitative data. Further, the Examiner contends that the calibration parameters of *Courtney* that relate to aspect ratios, focal lengths, etc., are "quantitative data" and therefore read on the term "statistics".

Claims 1 and 35 have been amended to recite that *statistical probability analysis* of the parameters of the stereoscopic image capture device are used in the determination of the first and/or second rectification transformations. Neither *Papadimitriou* nor *Courtney* have not been shown to teach or suggest using *statistical probability analysis* of the parameters of the stereoscopic image capture device are used in the determination of the first and/or second rectification transformations, as recited in claims 1 and 35.

The remaining art (*Zhang* and *Lipton*) have not been found to make up for the deficiencies of *Papadimitriou* or *Courtney*. Accordingly, claims 1 and 35 are both novel and unobvious over the cited art.

Claims 2, 7-10, 15-17, 19 21 and 37-38 directly or indirectly depend from claims 1 ore 35 and, therefore, can be distinguished from the cited art for at least the same reasons.

Accordingly, withdrawal of the rejection of claims 2, 7-10, 15-17, 19 21 and 37-38 is respectfully requested.

B. Claims 28-30, 32, and 41-42

Claims 28-30, 32 and 41-42 stand rejected as being unpatentable over *Courtney* in view of U.S. Patent No. 5,142,357 to *Lipton* in further view of Applicant's admitted prior art. Claims 25-27 stand rejected as being unpatentable over *Courtney* in view of *Zhang*. Withdrawal of the rejection is requested for at least the following reasons.

As was discussed above, independent claims 22 and 39 have been amended and now recite the aspect wherein the first and second rectification transformations are determined so that the first and second rectification transformations correspond to a virtual alignment to a parallel camera setup, wherein determining the first and second rectification transformation includes calculating a shear component such that a final matrix is a combination of a rotation and a translation and at least one internal camera parameter.

Courtney discloses a rectification transform that is expressed as a 3x3 homogeneous coordinate transform. *Courtney*, however, has not been found to disclose determining the first and second rectification transformation by calculating a shear component such that a final matrix is a combination of a rotation and a translation and at least one internal camera parameter.

Lipton, *Zhang* and Applicant's admitted prior art have not been found to make up for the deficiencies of *Courtney*. Accordingly, claims 22 and 39 are both novel and unobvious over the cited art.

Claims 28-30, 32 and 41-42 directly or indirectly depend from claims 22 ore 39 and, therefore, can be distinguished from the cited art for at least the same reasons.

Accordingly, withdrawal of the rejection of claims 28-30, 32 and 41-42 is respectfully requested.

III. CONCLUSION

Accordingly, all claims are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Respectfully submitted,

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